

PTSD Subclusters and Functional Impairment in Kosovo Peacekeepers

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ABSTRACT Peacekeepers deployed to Kosovo ($N = 203$) were evaluated prospectively, before the mission (August 2000) and at postdeployment, on a number of mental health and functional impairment variables. We examined the association between PTSD symptom subclusters and three indicators of functional impairment using hierarchical regression analyses, controlling for PTSD symptoms before the mission, and history of prior trauma. In the first model, avoidance and hyperarousal symptoms uniquely predicted a conglomerate of functional impact outcomes (e.g., employment, family relationships, social functioning). In the second model, emotional numbing was the only significant predictor of violent behaviors. In the third model, re-experiencing symptoms were the only significant predictor of alcohol abuse problems. Overall, the four PTSD subclusters are differentially associated with varying functional impairment outcomes, which is important to note for evaluation and treatment purposes for veterans returning from overseas deployments.

INTRODUCTION

Post-traumatic stress disorder (PTSD) is associated with considerable functional incapacities in a variety of life domains.^{1,2} The most studied functional impact of PTSD is in the domain of intimate relationships. For example, Vietnam veterans with PTSD are less self-disclosing and emotionally expressive with partners than veterans without PTSD,^{1,2} and veterans and civilians with PTSD report poorer social support, greater marital dissatisfaction, and higher rates of marital separation and divorce when compared to their counterparts without PTSD.^{1,3-7} Furthermore, the adverse affect of PTSD on family functioning may exert a secondary impact on psychosocial adjustment in other members of the family system, with both partners and children of individuals with PTSD also showing elevated rates of psychological distress.⁸

Numerous studies have also found higher rates of job turnover, unemployment, and greater financial difficulties among veteran^{6,7,9-11} and civilian populations^{3,12} with post-traumatic stress symptoms. In some instances, difficulties in social role functioning may lead to more severe problems in psychosocial adjustment, including homelessness and criminality. High rates of PTSD symptoms have been observed among homeless populations^{13,14} and at least one study has found that PTSD symptoms preceded homelessness,¹⁵ suggesting that post-traumatic stress served as a risk factor rather than a consequence of homelessness.

High levels of hostility, aggression, and violence are also associated with PTSD and these problems have been shown to contribute to difficulties in social and occupational functioning. The severity of PTSD endorsed by veterans, who often cite difficulty controlling anger as one of their most salient concerns,¹⁶ is associated with anger and aggression problems.¹⁷⁻¹⁹ Veterans with PTSD display higher rates of aggressive and violent behavior, poorer regulation of anger, and more accepting attitudes toward violence as a means for resolving conflicts.^{4,13,19-23} As with many forms of impaired functioning associated with PTSD, increased aggression often takes its greatest toll on family and intimate relationships. Veterans with PTSD are more likely to engage in verbal and physical assaults against intimate relationship partners than are veterans not diagnosed with PTSD, and severity of PTSD symptoms has been associated with more frequent and more severe verbally and psychologically abusive behavior in intimate relationships.^{17,23-25}

Attempts to cope with distressing PTSD symptoms can lead to a number of impairing outcomes, including problematic substance abuse. The association between PTSD and alcohol abuse is particularly strong in veteran populations.¹³ Severity of PTSD symptoms is positively correlated with substance abuse severity^{26,27} and patients with PTSD and substance use problems also report more severe PTSD symptoms, particularly in the avoidance and arousal cluster, than do patients with PTSD alone.²⁸

Although sufficiently frequent and severe symptoms as well as functional impairment are required for a DSM-IV diagnosis of PTSD, little is known about the ways in which functional impairment may vary by PTSD subclusters (e.g., avoidant symptoms). Because PTSD is a highly heterogeneous disorder, with sets of relatively disparate symptoms and problems, a PTSD diagnosis fails to capture individuals' unique constellation of trauma-related problems (e.g., re-experiencing, avoidance/numbing, and hyperarousal), each of which is likely to be uniquely associated with PTSD-related functional

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impairment. If unique links between symptom clusters and functional impairment are found, this knowledge can influence assessment and treatment strategies.

Avoidance and emotional numbing symptoms in particular appear to have especially deleterious effects on functional outcomes. Studying survivors of the Oklahoma City bombing, North and colleagues²⁹ found that although re-experiencing and hyperarousal symptoms were most prevalent, relatively less common numbing and avoidance symptoms were most strongly associated with functional impairment (in occupational and relationship domains) and psychiatric comorbidity. Similar results were found by McMillen et al.³⁰ who found that among survivors of the Northridge, California earthquake, the presence of PTSD avoidance and numbing symptoms was associated with increased psychiatric comorbidity. In a community sample, Breslau and colleagues³¹ found that distinct symptom profiles were associated with differences in overall PTSD severity; more severe emotional numbing symptoms distinguished PTSD-diagnosed individuals with pervasive disturbance from those who were higher functioning. Examining the relationship between PTSD symptoms clusters and perceived parent-child relationship quality in Vietnam combat veterans, Ruscio and colleagues³² found that only emotional numbing symptoms were related to perceived relationship quality.³²

In this study, we evaluated the relationship between specific symptom clusters and various indices of functional impairment in peacekeepers deployed to Kosovo. Participants completed assessments at predeployment, including measures of PTSD symptom and trauma history, and again at postdeployment. We hypothesized that, after controlling for predeployment trauma and symptoms, postdeployment avoidance and emotional numbing symptoms would be most strongly related to postdeployment functional impairment, including social and occupational functioning, violent behaviors, and problem drinking behaviors.

METHODS

Participants

In August 2000, approximately 2 to 3 weeks prior to their deployment to Kosovo, active-duty army air base and ground troop soldiers stationed at a U.S. military base were recruited to participate in this study. Soldiers were informed that participation was completely voluntary and 1,132 soldiers agreed to participate. All soldiers who were present for duty were asked to participate, but there is no information on the rate of refusal. Of participating soldiers, 324 (29%) agreed to be involved in a follow-up assessment and provided postdeployment contact information. We were able to contact 203 (18%) of these soldiers by mail or phone for a follow-up interview an average of 7 months after they returned from Kosovo. Soldiers who completed the follow-up interview reported the following roles in Kosovo: 41% combat arms; 21% combat support; 21% service support; and 17% "other." Demographic and military characteristics of participating soldiers can be found

in Table I. Participants' mental health descriptive information has been reported previously.³³

Procedure

While completing their deployment paperwork at a U.S. military base, soldiers deployed for the peacekeeping mission in Kosovo were recruited to participate in this study. An officer in charge of briefing the soldiers first told them about the study. The first page of the survey provided instructions, informed soldiers that their participation was voluntary, and ensured their confidentiality. The VA Boston Institutional Review Board (IRB) approved all procedures and materials. Soldiers completed the survey in a large auditorium under standardized conditions with a research coordinator present to provide instructions and answer questions. The questionnaire took about 45 minutes to complete and soldiers were asked to indicate whether they would be willing to be contacted postdeployment to participate in a follow-up survey. Well-trained interviewers from a national survey research organization conducted follow-up surveys by phone, which took 30 to 45 minutes to complete. Individuals who could not be contacted by phone, but for whom current addresses were available, were sent the survey via the mail.

Predeployment Measures

The predeployment measures utilized in this study include a demographics questionnaire, a measure of exposure to prior traumatic events, and a measure of predeployment PTSD symptoms.

Demographic and Military Variables

Soldiers were asked to report the following demographic and military variables: age, gender, race, education, and rank.

TABLE I. Descriptives for Demographics of Kosovo Peacekeepers ($N = 203$)

Demographic and Military Characteristics	Means and Percentages for Participating Soldiers (%)
Age (years)	Mean = 28.30 (SD = 6.56)
Gender	
Male	93
Female	7
Race	
Caucasian	65
African-American	18
Latino	12
Asian-American	1
Other	4
Highest level of education	
High school diploma or less	50
Some college/technical school	29
College degree or higher	21
Rank	
Junior enlisted (E1-E4)	43
Noncommissioned officers (E5-E9)	45
Officers (O1 and higher; warrant officers)	12

The Life Events Checklist (LEC)

The LEC was developed concurrently with the Clinician Administered PTSD Scale (CAPS) and was designed to be administered before administration of the CAPS to screen for potentially traumatizing events (PTEs) that respondents may have experienced. It consists of 16 items inquiring about the experience of PTEs known to result in PTSD or other post-traumatic symptoms. For each PTE, a score of 1 was assigned only if the respondent reported directly experiencing an event, and a 0 was assigned if any other response option was endorsed. A recent study found that the LEC exhibits excellent test-retest reliability and good convergence with existing measures of trauma history.³⁴ In a clinical sample of combat veterans, the LEC was significantly correlated with measures of psychological distress and was more strongly predictive of PTSD symptoms than was a measure of combat exposure.³⁴

PTSD Checklist (PCL)

PTSD symptoms were assessed using a modified version of the PTSD Checklist.³⁵ This instrument uses a 5-point Likert scale ranging from 1 "not at all" to 5 "extremely," to evaluate the severity of each of the 17 PTSD symptoms in the DSM-IV (e.g., "repeated, disturbing dreams of the stressful experience"). This scale has demonstrated excellent internal consistency ($\alpha = 0.97$) as well as good sensitivity and specificity (0.82, and 0.83, respectively).³⁵⁻³⁷ The Cronbach α for the current sample was 0.97 at predeployment. The PCL was also used to create the PTSD symptom cluster variables. The B symptoms cluster variable was composed of items 1-5. The C symptom cluster was parsed into two variables, on the basis of existing factor analytic studies that demonstrate that dividing C cluster items into avoidance and emotional numbing factors is most parsimonious.³⁸ The C symptoms avoidance cluster consisted of items 6 and 7, and the C symptoms emotional numbing cluster consisted of items 9-11. The D symptoms cluster variable was composed of items 13-17.

Postdeployment Measures

The postdeployment survey consisted of self-report measures to assess a number of psychological outcome variables as well as functional impairment variables postdeployment.

PTSD

The PCL was repeated during the postdeployment survey, with some items referring specifically to the Kosovo experience. The α reliability for this measure at postdeployment was 0.92.

Functional Impairment

An 8-item measure of functional impairment was used to assess basic, physical, and mental health-related functional impairment in Kosovo veterans. This measure was adapted from the National Vietnam Veterans Readjustment Study (NVVRS); soldiers were asked to rate whether they needed help in eight areas, which included: basic needs (food, hous-

ing), finance, drug, employment, legal, family/relationships, social functioning, and medical problems. Items were scored dichotomously and a sum score was utilized to determine the number of areas in which veterans reported being functionally impaired.

Violent Behaviors

Nine items from the NVVRS (violent behaviors) were used to measure. Participants were asked to rate whether they participated in a number of violent behaviors postdeployment (e.g., pushing, grabbing, shoving someone; beating up someone; using a gun or knife on another person) on a dichotomous scale (yes/no). The α reliability for this measure was 0.70.

Alcohol Use

The CAGE is a four-item measure that was used to assess problem drinking among veterans.³⁹ Participants were asked four dichotomously rated questions relating to their alcohol use in the past month. Questions included indicators of problem drinking, such as feelings of guilt in reaction to drinking, thinking that one has a current problem with alcohol abuse, and wanting to cut down on drinking. The α reliability of this measure was 0.77.

RESULTS

All of the analyses in this study were conducted using the statistical software package SPSS version 15 for Windows.

Multiple Regression Analyses

Our goal was to examine the PTSD symptom clusters that were associated with three functional impairment outcomes at postdeployment, after controlling for predeployment potentially traumatic experiences and PTSD symptoms. The outcome variables that we chose to examine included a conglomerate of eight functional impairment difficulties, violent behaviors, and problem drinking, all of which have been postulated to be difficulties postdeployment. We employed the following four postdeployment PTSD subclusters as predictors: re-experiencing, avoidance, emotional numbing, and arousal.

Before conducting hierarchical regressions to test predictors of these functional impairment outcomes, we examined correlations between a number of potentially related demographic and military variables and each of the three functional impairment outcomes. Demographic and military variables included age, gender, ethnicity, education, and rank. If a correlation was significantly correlated with any of the outcomes, then the appropriate demographic or military variable was included in the corresponding regression equation. Correlations among demographics, predictors, and outcomes are depicted in Table II.

Predictors of Postdeployment Functional Impairment

In the hierarchical regression model predicting the conglomerate of functional impairment at postdeployment (see Table III),

TABLE II. Correlations among Variables in Regression Models

Variable	1	2	3	4	5	6	7	8	9	10	11
(1) Age	—										
(2) Rank	0.43**	—									
(3) Pre-PTSD Sxs	-0.17*	-0.26**	—								
(4) Trauma Exposure	0.05	-0.10	0.15*	—							
(5) PTSD B Sxs	-0.02	-0.06	0.37**	0.04	—						
(6) PTSD Avoidance	-0.02	-0.11	0.26**	0.08	0.72**	—					
(7) PTSD Numbing	-0.03	-0.11	0.33**	0.16*	0.59**	0.67**	—				
(8) PTSD D Sxs	-0.03	-0.12	0.37**	0.07	0.84**	0.85**	0.73**	—			
(9) Fx Impairment	-0.05	-0.20**	0.38**	0.11	0.41**	0.34**	0.47**	0.46**	—		
(10) Violence	-0.24**	-0.25**	0.44**	0.13	0.30**	0.33**	0.46**	0.41**	0.48**	—	
(11) Drinking	-0.07	-0.16	0.29**	-0.05	0.53**	0.42**	0.35**	0.45**	0.37**	0.26**	—

Rank was coded as follows: 1 = junior enlisted (E1–E4); 2 = noncommissioned officers (E5–E9); 3 = officers (O1 and higher, and warrant officers). PTSD symptoms were measured with the PCL and trauma exposure with the LEC. Sxs, symptoms.

* $p < 0.05$, two-tailed; ** $p < 0.01$, two-tailed.

TABLE III. Final Models for Multiple Regressions of Functional Impairment Variables

Predictors	Functional Impairment			Violent Behaviors			Problem Drinking		
	β	T	R^2	β	T	R^2	β	T	R^2
Step 1:									
Age	—	—	0.17**	-0.12	-1.72	0.24**	—	—	0.10**
Rank	-0.10	-1.49		-0.06	-0.83		—	—	
Pre-PTSD Sxs	0.20*	2.81		0.31***	4.39		0.04	0.46	
Trauma Exposure	0.03	0.47		0.01	0.10		-0.04	-0.53	
Step 2:									
PTSD B Sxs	-0.05	-0.38	0.33**	-0.06	-0.52	0.34**	0.39*	2.42	0.30***
PTSD Avoidance	-0.26*	-2.08		0.04	0.34		0.09	0.66	
PTSD Numbing	-0.16	1.63		0.19*	1.96		0.06	0.51	
PTSD D Sxs	0.53**	2.97		0.18	1.05		0.03	0.14	

Demographic variables were only included in the regression if they were correlated with outcomes; as a result, inclusion in different outcome regressions vary. $F(7,165) = 11.46$, $p < .001$ for functional impairment conglomerate; $F(8,166) = 10.84$, $p < .001$ for violent behaviors; $F(6,112) = 7.94$, $p < .001$ for problem drinking. Numbers may vary slightly because of missing data.

* $p \leq 0.05$; ** $p < 0.01$; *** $p < 0.001$.

rank was first entered in block 1 to partial out the variance attributable to this military characteristic. As this was a prospective study, we were able to control for previous potentially traumatic events and baseline PTSD symptoms, each of which was also entered in block 1. In block 2, we entered each of the four PTSD subclusters to determine whether they significantly predicted functional impairment at postdeployment.

The model specified accounted for 33% of the variance in postdeployment functional impairment. After controlling for rank, prior trauma, and predeployment PTSD symptoms, PTSD avoidance symptoms ($B = -0.26$, $p < 0.05$) and PTSD arousal symptoms ($B = 0.53$, $p < 0.01$) emerged as significant predictors of postdeployment functional impairment, with arousal symptoms being the strongest predictor (i.e., twice as strong, as compared to avoidance).

Predictors of Postdeployment Violent Behaviors

In the hierarchical regression model predicting violent behaviors at postdeployment (see Table III), age, rank, potentially traumatic events, and predeployment PTSD symptoms were

entered in block 1, followed by each of the four PTSD subclusters in block 2.

The model specified accounted for 34% of the variance in postdeployment violent behaviors. After controlling for rank, prior trauma, and prior PTSD symptoms, PTSD emotional numbing symptoms ($B = 0.19$, $p \leq 0.05$) emerged as the only significant subcluster predictor of postdeployment violent behaviors.

Predictors of Postdeployment Problem Drinking

In the hierarchical regression model predicting problem drinking at postdeployment (see Table III), none of the demographic or military characteristic variables were significantly related to problem drinking, and as a result, these variables were not included in the regression equation. Subsequently, potentially traumatic events and predeployment PTSD symptoms were entered in block 1, followed by each of the four PTSD subclusters in block 2.

The model specified accounted for 30% of the variance in postdeployment problem drinking. After controlling for prior trauma and prior PTSD symptoms, PTSD re-experiencing

symptoms ($B = 0.39, p < 0.05$) emerged as the only significant subcluster predictor of postdeployment problem drinking.

DISCUSSION

We found that the four PTSD subclusters were differentially associated with various functional impairment outcomes. Contrary to our prediction, arousal symptoms were most strongly associated with a conglomerate of functioning indices, including difficulties in employment, relationships, legal matters, medical problem, etc. This is not surprising, given that the arousal subcluster includes difficulties sleeping, irritability, and hypervigilance, among other symptoms. Insomnia can be the precursor to a number of problems, and one can imagine that it is difficult to maintain a high level of functioning at work, school, or in relationships when sleep is lacking, which also likely impacts levels of concentration and irritability. Furthermore, those who are constantly on guard may have a more difficult time maintaining employment since precious cognitive resources are allocated to the maintenance of safety and constantly scanning one's environment, thereby making optimal functioning in employment and other arenas more challenging. Irritability also may impede the ability to form close working relationships, especially if others feel like they are "walking on eggshells." This also applies to the domain of romantic and family relationships, given that irritability and constant vigilance will likely impact functioning of the dyad and/or family, especially when there are children involved. If one is more irritable, the likelihood of legal difficulties also may be increased; for example, individuals have shorter fuses and may be more likely to get into physical fights. Hypervigilance also takes a toll on the body and nervous system, and in the long term, has been shown to be associated with cardiovascular and other medical problems.^{40,41}

Avoidant symptoms were also inversely associated with the functional impairment composite. Although these findings are in the opposite direction of what we would expect, it is important to remember that soldiers were surveyed only a few months after returning home from their deployment; consequently, while avoidance may work in the short term, research has shown that it has deleterious effects in the long run. The impact of avoidance on functioning should continue to be assessed over time in these peacekeepers.

Emotional numbing symptoms were most strongly associated with violent behaviors in the aftermath of deployment. There is prior evidence that suppressing emotional expression is associated with emotional dysregulation, thereby increasing the risk for aggressive and violent behaviors among men with a history of interpersonal violence.⁴² Given that emotional numbing is such a prominent feature of PTSD, it is not surprising that unexpressed emotions may "build up" and ultimately be expressed as explosive anger. Unfortunately, given the build up of intense emotion, oftentimes anger is not only experienced emotionally, but acted upon, creating the risk for aggressive behaviors and in some cases interpersonal violence.

In better understanding these findings, it is important to recognize that in the war zone, soldiers learn to numb their emotions as a part of their daily functioning to survive. In the war zone, emotional expression may detract from focus and increase the risk for mortality; as a result, numbing becomes quite functional and necessary as soldiers carry out their duties. Loss of comrades, injury, exposure to death and dying, etc. must be suppressed or channeled into anger to continue with war zone missions. Anger becomes quite functional in this respect, and emotions are quickly translated into behavioral responses. Unfortunately, while this survival strategy works at war, civilian life requires regulated emotional expression rather than explosive anger to have successful relationships and function well in postdeployment domains.

We also found that re-experiencing symptoms, in particular, were most strongly associated with problem alcohol use postdeployment. These findings replicate past research reporting an association between re-experiencing symptoms and problem drinking among airline-disaster responders⁴³ and Red Cross terrorism responders.⁴⁴ Individuals exposed to a variety of traumatic experiences may utilize alcohol in an attempt to cope with seemingly unmanageable re-experiencing symptoms. While there is an abundance of research demonstrating that alcohol use is strongly associated with PTSD, both in terms of problem use and as a comorbid disorder, there are fewer studies that particularly implicate re-experiencing symptoms in this equation. This information has important implications for the assessment and treatment of PTSD and alcohol use disorders.

There are several limitations to this study that should be noted. Given that this is a sample of convenience, surveyed soldiers may not be representative of all soldiers deployed to Kosovo, which consequently limits the external validity of this study. Furthermore, only a small percentage of soldiers who were surveyed at predeployment agreed to be contacted postdeployment, which also limits external validity. Future studies should explore reasons for this discrepancy. It may be that soldiers who are invested in their privacy may feel greater stigma about mental health postdeployment.^{45,46} As a result, these findings should be interpreted with a degree of caution. These results also should not be generalized to soldiers at large, given that peacekeeping duties are quite different than war zone duties, as are peacekeeping roles and rules of engagement. This sample also contained a small percentage of women, and given that women now make up about 12% of military personnel deployed to Iraq and Afghanistan, future studies should oversample women to best understand the relationship between PTSD subclusters and functional impairment. We also used self-report symptom measures in this study rather than clinician-administered measures and/or physiological reactivity measures (e.g., heart rate), which may limit external validity. Related, in this study we examine the relationship between functional impairment and post-traumatic stress symptoms, rather than PTSD diagnosis *per se*. As a result, these findings should not be limited to those with

a PTSD diagnosis but rather interpreted within the framework of the stress response continuum. These preliminary results also should be replicated and extended in future studies.

Overall, given that subclusters are differentially associated with functional outcomes, the assessment and treatment of returning peacekeepers should include a thorough evaluation of severity of subclusters and an individual's profile of symptoms, rather than focusing solely on whether criteria for a DSM-IV diagnosis of PTSD is met. Paying close attention to subclusters will provide more comprehensive information about which symptoms of PTSD are particularly troublesome, and will allow practitioners to plan accordingly for the care of these soldiers. Comprehensive assessments of functional impairment are also important. Often, PTSD assessments focus on functioning in employment and social domains rather than more comprehensively assessing functional outcomes (e.g., legal issues, financial functioning, etc.). Utilizing a comprehensive measure of functioning will especially be important in detecting the full range of problems that soldiers may experience yet may be too proud to share if not specifically asked. Implications for treatment are also important to address; for example, if these findings are replicated in future studies, treatment providers may want to target emotional numbing in soldiers who exhibit precursors to postdeployment aggressive behaviors before these behaviors become entrenched. For example, engaging soldiers in anger management and/or emotional regulation groups, perhaps even as early as during the debriefing process, may be helpful in the postdeployment adjustment period in an attempt to minimize future violent behaviors. Here soldiers can be taught about how to express rather than numb emotions, as well as the consequences that may ensue with long-term suppression of emotions. Furthermore, if re-experiencing symptoms are a key ingredient in the maintenance of problem alcohol use, evidence-based treatments that specifically target this symptom cluster can be more widely utilized, a trend which is already being explored among those with PTSD and cocaine dependence.⁴⁷ Future studies should continue to explore the best treatment trajectory among those with both PTSD and problem alcohol use. Ultimately, the best care for returning veterans will take into account not only whether individuals have a PTSD diagnosis, but also the specific symptoms and related functional outcomes that are crucial to assess and target so that we can best assist our soldiers adjust in the aftermath of overseas deployments.

REFERENCES

1. Riggs DS, Byrne CA, Weathers FW, Litz BT: The quality of intimate relationships of male Vietnam veterans: problems associated with posttraumatic stress disorder. *J Trauma Stress* 1998; 11: 87–101.
2. Cook JM, Riggs DS, Thompson R, Coyne JC, Sheikh JI: Posttraumatic stress disorder and current relationship functioning among World War II ex-prisoners of war. *J Fam Psychol* 2004; 18: 36–45.
3. Amaya-Jackson L, Davidson JR, Hughes DC, et al: Functional impairment and utilization of services associated with posttraumatic stress in the community. *J Trauma Stress* 1999; 12: 709–24.
4. Jordan BK, Marmar CR, Fairbanks JA, et al: Problems with families of male Vietnam veterans with posttraumatic stress disorder. *J Consult Clin Psychol* 1992; 60: 916–26.
5. Whisman M: Marital dissatisfaction and psychiatric disorders: results from the National Comorbidity Survey. *J Abnorm Psychol* 1999; 108: 701–6.
6. Zatzick DF, Marmar CR, Weiss DS, et al: Posttraumatic stress disorder and functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. *Am J Psychiatry* 1997a; 154: 1690–5.
7. Zatzick DF, Weiss DS, Marmar CR, et al: Posttraumatic stress disorder and functioning and quality of life outcomes in female Vietnam veterans. *Milit Med* 1997b; 162: 661–5.
8. Galovski T, Lyons JA: Psychological sequelae of combat violence: a review of the impact of PTSD on the veteran's family and possible interventions. *Aggress Violent Behav* 2004; 9: 477–501.
9. Magruder KM, Frueh BC, Knapp RG, et al: Prevalence of posttraumatic stress disorder in Veterans Affairs primary care clinics. *Gen Hosp Psychiatry* 2005; 27: 169–79.
10. Savoca E, Rosenheck R: The civilian labor market experiences of Vietnam-era veterans: the influence of psychiatric disorders. *J Ment Health Policy Econ* 2000; 3: 199–207.
11. Smith MW, Schnurr PP, Rosenheck RA: Employment outcomes and PTSD symptom severity. *Ment Health Serv Res* 2005; 7: 89–101.
12. Kessler RC: Posttraumatic stress disorder: the burden to the individual and to society. *J Clin Psychiatry* 2000; 61: 4–12.
13. Kulka RA, Schlenger WE, Fairbank JA, et al: Trauma and the Vietnam War generation: report of findings from the National Vietnam Veterans Readjustment Study. New York, Brunner/Mazel, 1990.
14. Rosenheck R, Leda C, Gallup P: Combat stress, psychosocial adjustment, and service use among homeless Vietnam veterans. *Hosp Community Psychiatry* 1992; 43: 145–9.
15. North CS, Smith EM: Posttraumatic stress disorder among homeless men and women. *Hosp Community Psychiatry* 1992; 43: 1010–6.
16. Blum MD, Kelley E, Meyer K, Carlson C, Hodson L: An assessment of the treatment needs of Vietnam-era veterans. *Hosp Community Psychiatry* 1984; 35: 691–6.
17. Byrne CA, Riggs DS: The cycle of trauma: relationship aggression in male Vietnam veterans with symptoms of posttraumatic stress disorder. *Violence Vict* 1996; 11: 213–25.
18. Jakupcak M, Conybeare D, Phelps L, et al: Anger, hostility, and aggression among Iraq and Afghanistan war veterans reporting PTSD and sub-threshold PTSD. *J Trauma Stress* 2007; 20: 945–54.
19. McFall ME, Fontana A, Raskind M, Rosenheck R: Analysis of violent behavior in Vietnam combat veteran psychiatric inpatients with posttraumatic stress disorder. *J Trauma Stress* 1999; 12: 501–17.
20. Beckham JC, Feldman ME, Kirby AC, Hertzberg MA, Moore SD: Interpersonal violence and its correlates in Vietnam veterans with chronic posttraumatic stress disorder. *J Clin Psychol* 1997; 53: 859–69.
21. Freeman TW, Roca V: Gun use, attitudes toward violence, and aggression among combat veterans with chronic posttraumatic stress disorder. *J Nerv Ment Dis* 2001; 189: 317–20.
22. Lasko NB, Gurvits TV, Kuhne AA, Orr SP, Pitman RK: Aggression and its correlates in Vietnam veterans with and without chronic posttraumatic stress disorder. *Compr Psychiatry* 1994; 35: 373–81.
23. Taft CT, Vogt DS, Marshall AD, Panuzio J, Niles BL: Aggression among combat veterans: relationships with combat exposure and symptoms of posttraumatic stress disorder, dysphoria, and anxiety. *J Trauma Stress* 2007; 20: 135–45.
24. Carroll EM, Rueger DB, Foy DW, Donahoe CP: Vietnam combat veterans with posttraumatic stress disorder: analysis of marital and cohabitating adjustment. *J Abnorm Psychol* 1985; 94: 329–37.
25. Glenn DM, Beckham JC, Feldman ME, Kirby AC, Hertzberg MA, Moore SD: Violence and hostility among families of Vietnam veterans with combat-related posttraumatic stress disorder. *Violence Vict* 2002; 17: 473–89.

26. Brown PJ, Sout RL, Gannon-Rowley J: Substance use disorder-PTSD comorbidity: patients perceptions of symptom interplay and treatment issues. *J Subst Abuse Treat* 1998; 15: 445-8.
27. Stewart SH, Conrod PJ, Pihl RO, Doniger M: Relationships between posttraumatic stress symptom dimensions and substance dependence in a community-recruited sample of substance-abusing women. *Psychol Addict Behav* 1999; 13: 78-88.
28. Saladin ME, Brady KT, Dansky BS, Kilpatrick DG: Understanding comorbidity between PTSD and substance use disorders: two preliminary investigations. *Addict Behav* 1995; 20: 643-55.
29. North CS, Nixon SJ, Shariat S, Mallonee S, McMillen JC, Spitznagel EL: Psychiatric disorders among survivors of the Oklahoma City bombing. *JAMA* 1999; 282: 755-62.
30. McMillen JC, North CS, Smith EM: What parts of PTSD are normal: intrusion, avoidance, or arousal? Data from the Northridge, California earthquake. *J Trauma Stress* 2000; 13: 57-75.
31. Breslau N, Reboussin BA, Anthony JC, Storr CL: The structure of post-traumatic stress disorder: latent class analysis in two community samples. *Arch Gen Psychiatry* 2005; 62: 1343-51.
32. Ruscio AM, Weathers FW, King LA, King DW: Male war-zone veterans' perceived relationships with their children: the importance of emotional numbing. *J Trauma Stress* 2002; 15: 351-7.
33. Maguen S, Litz BT, Wang JL, Cook M: The stressors and demands of peacekeeping in Kosovo: predictors of mental health response. *Milit Med* 2004; 169: 198-206.
34. Gray MJ, Litz BT, Wang JL, Lombardo TW: Psychometric properties of the Life Events Checklist. *Assessment* 2004; 11: 330-41.
35. Weathers FW, Litz BT, Herman DS, Huska JA, Keane TM: The PTSD Checklist (PCL): reliability, validity, and diagnostic utility. Paper presented at the annual meeting of the International Society for Traumatic Stress Studies, San Antonio, TX, 1993.
36. Blanchard EB, Jones-Alexander J, Buckley TC, Forneris CA: Psychometric properties of the PTSD Checklist. *Behav Res Ther* 1996; 13: 669-73.
37. Ventureyra VA, Yao SN, Cottraux J, Note I, De Mey-Guillard C: The validation of the Posttraumatic Stress Disorder Checklist Scale in post-traumatic stress disorder and nonclinical subjects. *Psychother Psychosom* 2002; 71: 47-53.
38. Asmundson GJ, Frombach I, McQuaid J, Pedrelli P, Lenox R, Stein MB: Dimensionality of posttraumatic stress symptoms: a confirmatory factor analysis of DSM-IV symptom clusters and other symptom models. *Behav Res Ther* 2000; 38: 203-14.
39. Ewing JA: Detecting alcoholism, the CAGE questionnaire. *JAMA* 1984; 252: 1905-7.
40. Boscarino JA: Posttraumatic stress disorder and mortality among U.S. Army veterans 30 years after military service. *Ann Epidemiol* 2006; 16: 248-56.
41. Boscarino JA: A prospective study of PTSD and early-age heart disease mortality among Vietnam veterans: implications for surveillance and prevention. *Psychosom Med* 2008; 70: 668-76.
42. Tull MT, Jakupcak M, Paulson A, Gratz KL: The role of emotional inexpressivity and experiential avoidance in the relationship between post-traumatic stress disorder symptom severity and aggressive behavior among men exposed to interpersonal violence. *Anxiety Stress Coping* 2007; 20: 337-51.
43. Stewart SH, Mitchell TL, Wright KD, Loba P: The relations of PTSD symptoms to alcohol use and coping drinking in volunteers who responded to the Swissair Flight 111 airline disaster. *J Anxiety Disord* 2004; 18: 51-68.
44. Simons JS, Gaher RM, Jacobs GA, Meyer D, Johnson-Jimenez E: Associations between alcohol use and PTSD symptoms among American Red Cross disaster relief workers responding to the 9/11/2001 attacks. *Am J Drug Alcohol Abuse* 2005; 31: 285-304.
45. Jones E, Hyams KC, Wessely S: Screening for vulnerability to psychological disorders in the military: an historical survey. *J Med Screen* 2003; 10: 40-6.
46. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL: Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N Engl J Med* 2004; 351: 13-22.
47. Brady KT, Dansky BS, Back SE, Foa EB, Carroll KM: Exposure therapy in the treatment of PTSD among cocaine-dependent individuals: preliminary findings. *J Subst Abuse Treat* 2001; 21: 47-54.